



FIXED PRICE  
RESEARCH & DEVELOPMENT CONTRACT  
**Specimen Contract Dated 02/13/01**

Contract No. **TBD**

**BETWEEN**

CALIFORNIA INSTITUTE OF TECHNOLOGY  
JET PROPULSION LABORATORY  
(The "Institute" or "JPL")  
4800 OAK GROVE DRIVE  
PASADENA, CALIFORNIA 91109-8099

**AND**

**TBD**

THIS CONTRACT FOR

**Mars Sample Return (MSR) Technical Approach Study**

IS A

SUBCONTRACT UNDER JPL's NASA PRIME CONTRACT

TASK ORDER NO. **10057**

A DO - C9 Rating is assigned to this Contract under DMS Regulation 1

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GENERAL PROVISIONS: Fixed-Price Research and Development Contract, R1/01, with included Exhibits.

JPL 1737, Release of Information, R 9/99

JPL 2385, Notification to Prospective Contractors of JPL's Ethics Policies and Anti-Kickback Hotline, R7/91

JPL 2892, Certifications of Nonsegregated Facilities, Clean Air and Water, Anti-Kickback Compliance, Americans with Disabilities Act Compliance, Certification and Disclosure Regarding Payments to Influence Certain Federal Transactions, Certification of Full Disclosure Regarding Debarred, Suspended, or Proposed for Debarment Status, and Certification of Toxic Chemical Release Reporting, R 4/99

ADDITIONAL GENERAL PROVISIONS (AGPs)

Cost Accounting Standards and Administration of Cost Accounting Standards R 4/99

or

Disclosure And Consistency of Cost Accounting Practices, And Administration of Cost Accounting Standards R 4/99

New Technology R/99 (Large Business)

or

Patent Rights - Retention By The Contractor (Short Form) R 4/99 (Small Business)

Progress Payments R 4/99 or

Progress Payments - Small Business R 4/99

Safety and Health R 4/00

**PREAMBLE**

This Contract, entered into on \_\_\_\_\_ by and between the CALIFORNIA INSTITUTE OF TECHNOLOGY (hereinafter called the "Institute" or "JPL"), a corporation organized and existing under the laws of the State of California, and **“TBD”** (hereinafter called the "Contractor"), a corporation organized and existing under the laws of the State of **TBD** and constituting a subcontract under Prime Contract NAS7-1407 between the Institute and the Government;

**WITNESSETH THAT:**

The Contractor agrees to furnish and deliver the supplies and perform the services set forth in this Contract for the consideration stated herein.

Schedule

ARTICLE 1. STATEMENT OF WORK AND DELIVERY INSTRUCTIONS

On or Before

- 1.0 The Contractor shall develop technical approaches and mission concepts for a Mars Sample Return (MSR) mission to be launched in 2011. The study shall be performed in accordance with requirements set forth below and in accordance with Exhibits I through VII provided herein. The study is divided into two Phases: 1 and 2.

In the performance of Phase 1, the Contractor shall:

- 1.1 Provide a broad preliminary sample return mission(s) trade study to include the following:
- 1.1.1 A diverse set of potentially viable technical approaches for the sample return mission or missions that are consistent with the budget and other elements of the Mars Exploration Program as outlined in Exhibit I and with the assumptions and constraints in Exhibit VII, and that address the science objectives in Exhibit II and the planetary protection goals in Exhibit III.
- 1.2 Study each identified trade option in Exhibit IV (as well as other options identified during the study) and list the pros and cons for each option and provide a rationale for choice of approach for each trade. Generate information on sensitivities of this rationale to science requirements and to other program and mission trades. **JPL reserves the right to modify the Trades Lists and Supporting Information listed in Exhibit IV.**
- 1.3 Generate at least two mission(s) concepts based on the selected approaches that would rank highly when evaluated against the criteria in paragraph 1.4 below. Provide the rationale for formulating these concepts in terms of the cost/risk/science balance. Mission here is defined as beginning at an Earth launch and ending at the return of a Martian sample to the Earth's surface. One of the concepts shall satisfy but not exceed the "science baseline" as defined in Exhibit II. The other(s) may provide either more or less aggressive science content as outlined in Exhibit II while attempting to stay below two billion dollars development cost (as defined in Exhibit I). While a 2011 launch should be the baseline for all concepts, the contractor should provide an assessment of the consequences of a launch slip to 2014 for each concept.
- 1.4 Conduct Preliminary Technical Approach (Phase 1) Review at JPL consisting of viewgraph presentations that include a review of the full range of approaches explored by the Contractor under paragraphs 1.1 through 1.3 and include viewgraphs describing the recommended mission concepts addressing the presentation content listed in Exhibit V. At the end of Phase 1, JPL will select one technical approach from those presented for further study by the Contractor in Phase 2. Technical approaches will be evaluated by JPL based on

- 1.4.1 Performance relative to sample returns objectives.
- 1.4.2 Development and life cycle costs.
- 1.4.3 In-flight missions risks and overall reliability.
- 1.4.4 Risks of technology readiness.
- 1.4.5 Technology legacy provided to future Mars missions.

In the performance of Phase 2, the Contractor shall:

- 1.5 Provide a more in-depth study of the technical approach selected by JPL. Provide a technical description of the resulting mission(s) concept, again addressing the items in Exhibit V.
- 1.6 Provide a development cost estimate for the (1) formulation, (2) implementation (including mission operations system), and (3) launch phases for each concept. Exclude the costs of the science payloads. Identify, but do not estimate, technology development and demonstration and mission operations cost elements. Where you recommend a flight demo of a new technology (see 1.7), assume it will be accomplished at the appropriate time but do not include its cost here.
- 1.7 Provide requirements on technology development consisting of:
  - 1.7.1 A listing of technology needs.
  - 1.7.2 Recommendations for required testing or flight validations.
- 1.8 Provide study results of sufficient depth and detail to enable JPL to:
  - 1.8.1 Evaluate the extent to which the concept can meet the science objectives listed in Exhibit II.
  - 1.8.2 Develop a more refined, profiled, life cycle cost estimate.
  - 1.8.3 Identify specific changes to the current baseline Mars technology program listed in Exhibit VI.
- 1.9 Conduct a Final Review, at the Contractor's facility or at a location mutually agreed upon between JPL and the Contractor, consisting of oral presentations that include a review of all work performed in Phase 2 of the Contract.

Pursuant to performance of both phases of the work, the Contractor shall:

- 1.10 Attend a technical Kick-Off meeting held at JPL (see Study Schedule in Section 3.0). The discussions shall include (1) study objectives, (2) clarifications and (3) a summary of prior sample return study efforts completed by JPL to date, and (4) a description of related elements of the NASA Mars Technology Program.
- 1.11 Participate in bi-weekly teleconferences with JPL for informal status

reports and technical updates.

- 1.12 Contact the JPL Contract Technical Monitor for information on previous studies and/or ongoing technical work.
- 1.13 Provide reports as described below:
  - 1.13.1 Ten (10) copies including one electronic copy (Microsoft Office 97 format on Zip-disk or CD-ROM) of the viewgraphs to be used for the Preliminary Technical Approach Review described in paragraph 1.4 above, including statement of the architectures deemed most viable by the Contractor. 10/19/01
  - 1.13.2 Ten (10) copies including one electronic copy (Microsoft Office 97 format on Zip-disk or CD-ROM) of the technology needs list and demonstration requirements documenting the effort described in paragraph 1.7 above. 10/19/01
  - 1.13.3 Ten (10) copies including one electronic copy (Microsoft Office 97 format on Zip-disk or CD-ROM) of the Final Report detailing the results of the studies outlined in paragraphs 1.1 through 1.9 above. The Final Report shall consist of viewgraphs to be used in the final review with text annotations on facing page. 10/19/01
- 2.0 The following Exhibits are hereby incorporated into and made a part of this Contract:
  - 2.1 Exhibit I, "Mars Exploration Program Overview", dated 02/22/01.
  - 2.2 Exhibit II "Mars Sample Return Science Objectives", dated 02/22/01.
  - 2.3 Exhibit III "Planetary Protection Requirements", dated 02/22/01.
  - 2.4 Exhibit IV "Trades List and Supporting Information", dated 02/22/01.
  - 2.5 Exhibit V "Technical Approach Study Products List", dated 02/22/01.
  - 2.6 Exhibit VI "Mars Technology Program", dated 02/22/01.
  - 2.7 Exhibit VII "Assumptions & Constraints", dated 02/22/01
- 3.0 Study Schedule and Deliverable Dates:
  - 3.1 Kick-Off meeting (1.10) 04/16/01
  - 3.2 Preliminary Technical Approach Review and delivery of viewgraphs package (1.4) and (1.13.1). 07/21/01
  - 3.3 Final Review and delivery of viewgraph package (1.9) and (1.13.3). 10/19/01
  - 3.4 Delivery of Technology Needs Report (1.7) and (1.13.2). 10/19/01

4.0 JPL will:

- 4.1 Conduct a Kick-Off meeting in which current concepts and ongoing technology work will be described for Contractor discussion and comment.
- 4.2 Provide information on a continuing basis per request to the contract Technical Monitor.
- 4.3 Conduct informal bi-weekly teleconferences with the Contractor.
- 4.4 Host the Preliminary Technical Approach Review as noted in paragraph 1.4 above.
- 4.5 Designate one technical approach for study in Phase 2 by 08/05/01.
- 4.6 Attend the Final Review as noted in paragraph 1.9 above.

5.0 Delivery Instructions

- 5.1 Except as otherwise provided in this Contract, the point of inspection, acceptance and delivery of all supplies deliverable under this Contract shall be the Jet Propulsion Laboratory, 4800 Oak Grove Drive, Pasadena, California 91109. All such supplies shall be packaged, packed, boxed, or crated in such a manner to ensure safe delivery and shall be shipped prepaid and at the Contractor's expense to the point of delivery.
- 5.2 Time is of essence in the performance of this Contract.
- 5.3 Large Business – The Contractor shall furnish the Contracting Officer (CO) with the annual and final reports of reportable items described in the Article entitled “New Technology.” Copies of transmittal letters for those reports shall be sent to the JPL Office of Patents and New Technology (OPANT) and to the cognizant JPL negotiator.
- 5.4 Small Business - The Contractor shall provide the Contracting Officer (CO) the annual and final reports of subject inventions described in the Article entitled “Patent Rights – Retention by the Contractor (Short Form).” Copies of transmittal letters shall be sent to the JPL Office of Patents and New Technology (OPANT) and to the cognizant JPL negotiator.

## ARTICLE 2. PRICE AND PAYMENT

1.0 Total Fixed Price: TBD

### 2.0 MINIMUM LEVEL OF EFFORT

The Contractor agrees to supply, at a minimum, “**TBD**” hours of Engineering effort in the performance of the tasks defined in Article 1. STATEMENT OF WORK and to maintain adequate records to show the hours expended. If after receipt of the deliverables defined in Article 1. DELIVERY OR PERFORMANCE SCHEDULE it is JPL’s judgment that the Contractor may have supplied less than “**TBD**” hours the Contractor shall be required to disclose the actual Engineering hours applied to the tasks defined in Article 1. If after JPL’s examination of the Contractor’s records the number of Engineering hours is less than “**TBD**” hours the contractor shall either be required to expend additional Engineering hours up to “**TBD**” hours in order to supply JPL with acceptable study deliverables or reduce the total fixed price of the contract. The Contractor shall not be entitled to an equitable adjustment should the expended Engineering hours exceed the minimum.

3.0 Invoices. Invoices shall be submitted, in triplicate, to JPL Accounts Payable, 4800 Oak Grove Drive, Pasadena, California 91109

### ARTICLE 3. LIMITATION OF JPL's OBLIGATION

- 1.0 The Firm Fixed Price of this Contract is the amount set forth in paragraph 1.0 of ARTICLE 2, PRICE AND PAYMENT, subject to the limitations set forth in this Article.
- 2.0 Subject to paragraph 6.0 below, the amount set forth in Period No. 1 of the following Incremental Liability Schedule reflects the maximum limitation of the Institute's liability for all purposes, including incurred costs, termination costs (including amounts payable with respect to subcontracts and settlement costs) and allowance for profit or fee:

#### INCREMENTAL LIABILITY SCHEDULE

<u>Period No.</u>	<u>Cumulative Maximum Liability</u>	<u>Terminal Date</u>
1	\$500,000.00	3 months ADC
2	Balance	N/A

- 3.0 It is anticipated that JPL shall, prior to the terminal date, if any, of the Period specified in the first line of paragraph 2.0 above, issue a Unilateral Modification to revise the maximum limitation to the amount set forth in the next successive period. The determination as to whether to issue such a modification shall be at JPL's sole discretion. In the event that JPL does not issue such a modification prior to the terminal date, this Contract shall, unless the Contractor requests a terminal date extension in writing prior to the terminal date, be deemed terminated for convenience and the Contractor shall proceed as if the Contractor has received a Notice of Termination pursuant to the GP Article entitled "Termination for Convenience." JPL shall, upon receipt of a written request from the Contractor for Terminal Date extension, immediately issue a unilateral modification extending the Terminal Date in accordance with Contractor's request. If the Contractor or JPL have reason to believe that any other change in the Incremental Liability Schedule would be in the best interest of the contract effort, the Contractor or JPL may notify the other party in writing to that effect, together with the requested change. If the Contractor and JPL agree with the requested change, the Incremental Liability Schedule will be revised by Supplemental Agreement to the Contract.
- 4.0 In the event that JPL issues such a UM to increase the liability after the terminal date, the Contract shall no longer be deemed terminated, and such UM shall have the same effect as if it had been issued prior to the terminal date; provided however, that if JPL's failure to issue the UM by the terminal date caused an increase of the cost of, or the time required for, performing this Contract, because the Contractor proceeded as if a Notice of Termination had been issued, an equitable adjustment shall be made in (i) the Contract Price, the time of performance, or both; and (ii) other affected terms of the Contract. The Contractor must assert its right to such equitable adjustment within 30 days of receipt of the UM. However, if JPL decides that the facts justify it, JPL may receive and act upon a proposal submitted before final payment of the Contract. Subject to paragraph 6.0 below, in the event that this Contract is terminated pursuant to this Article, or otherwise terminated by JPL pursuant to the GP Article entitled "Termination for Convenience," the cumulative liability amount set forth in the Incremental Liability Schedule for the Period referenced in the first sentence of paragraph 2.0 of this Article, reflects JPL's maximum liability notwithstanding anything to the contrary in the GP Article entitled "Termination for Convenience," or the value of supplies and services delivered to and retained by JPL.
- 5.0 The Contractor has used the Incremental Liability Schedule to plan its progress payments, partial payments, obligations and termination liability. It is a management prerogative of the Contractor to determine if any part of these elements are to be under funded or at risk (relative to the Incremental Liability Schedule) for any period of time. This is a firm fixed price type Contract. The Contractor assumes all risk for any variance between planned and actual costs, including planned and actual termination liability. The Contractor is strictly liable for all cost variances, including cost variances attributable to indirect rate changes and shall in no event be excused

from the obligation to complete performance in accordance with the price, delivery schedule, and technical requirements of this Contract.

- 6.0 If the Contract is modified, the provisions of this Article shall not limit the Contractor's obligation pursuant to GP Article entitled "Changes," to diligently pursue the performance of the Contract as modified. In the event that a unilateral modification contains a liability limit for work performed under such modification, the Contractor's obligation to pursue performance of such modification and the Institute's liability for such modification, shall, until the UM(s) is bilaterally settled, be limited by the amount of the liability limit included in the UM. Until such a UM is settled, the liability limit on the UM does not increase the baseline liability in paragraph 2.0. In the event that this Contract is deemed terminated pursuant to paragraph 3.0 of this Article or the GP Article entitled "Termination for Convenience," prior to the settlement of an outstanding UM(s), the Institute's maximum liability for all purposes, including incurred costs, termination costs (including amounts payable with respect to subcontracts and settlement costs and consideration for delivered supplies and services) and allowance for profit or fee, shall be no more than the sum of the cumulative liability amount set forth in the Incremental Liability Schedule for the Period referenced in the first sentence of paragraph 2.0 of this Article, plus the liability limit(s) set forth in the UM(s).
- 7.0 In the event that this Contract contains a provision providing for progress payments, such provision shall be subject to the limitations set forth in this Article and the "contract amount" referred to in any such provision for progress payments is the Firm Fixed Price of this Contract set forth in paragraph 1.0 of ARTICLE 2, PRICE AND PAYMENT.
- 8.0 The provisions of this Article shall in no way limit the Institute's rights under the GP Article entitled Default.

#### ARTICLE 4. SPECIAL PROVISIONS

##### 1.0 Key Personnel/Facilities

The personnel and/or facilities, if any, specified below are considered essential to the work being performed hereunder. Prior to removing, replacing, or diverting any of the specified individuals or facilities, the Contractor shall notify JPL reasonably in advance and shall submit justification (including proposed substitutions) in sufficient detail to permit evaluation of the impact on this Contract. No diversion shall be made by the Contractor without the written consent of JPL; provided, that JPL may ratify in writing the change, and such ratification shall constitute the consent of JPL required by this Article. Paragraph 1.2 below may, with the consent of the Contracting parties, be amended from time to time during the course of the Contract to either add or delete personnel and/or facilities, as appropriate.

The following Contractor personnel shall be considered Key Personnel under this Contract:

<u>Name</u>	<u>Title</u>	<u>% of Time Available to this Contract</u>
TBD	TBD	TBD

IN WITNESS WHEREOF, the parties hereto have executed this Contract as of the day and year first above written.

CALIFORNIA INSTITUTE OF TECHNOLOGY

By \_\_\_\_\_

By \_\_\_\_\_  
(Typed Name)

\_\_\_\_\_  
(Title)

Instructions to Contractor: Do not insert date on Preamble page.